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				NITRATE %	AMMONIA %	TOTAL
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NITROGEN SOLUTION ... 2	55.5	26.0	18.5	9.71	31.10	40.8
NITROGEN SOLUTION ... 3	66.8	16.6	16.6	11.69	25.34	37.0

Chemical Division
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The American FERTILIZER

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No. 8

The Role of Commercial Fertilizer in Soil Conservation*

By RALPH W. CUMMINGS

Associate Director, North Carolina Agricultural Experiment Station

THE problem of soil conservation is too often pictured in terms of gullied hill-sides on land that has been damaged almost beyond reclaim except through measures which are very expensive in comparison with the value of the land after reclamation. These conditions are truly serious and should be the occasion for sober thought.

But soil conservation does not begin or end here. An adequate program of soil conservation must provide for the maintenance of a permanent and *productive* agriculture and for the passing of soils from one generation to another in at least as high if not higher state of productivity than that in which they were received.

The management of soils to achieve this end will differ with the nature of the soils themselves, with the topography, with the climatic conditions of the area, and with the type of agriculture developed. The deplorable erosion conditions found in much of the Piedmont Plateau of the southeastern States reflect the fact that the agricultural pattern and soil-management practices developed since the white man came into the area have not been those which would maintain a permanent agriculture. These practices must be changed materially if the area is to come into its own.

At the coming of the white man, forests

covered the entire landscape. Forests alone would not support a large population in the new world and so the trees were cut off, burned or otherwise disposed of. Although the forests, of course, provided abundant building material and fuel, the main purpose of removing the trees was to clear the land for the cultivation of such crops as cotton and corn throughout the Southeast, and for tobacco, peanuts, vegetables and fruits in certain portions of the area.

Underneath the forest in the Southeast was a soil which had been leached of a large portion of its fertility, because of the warm temperature and high rainfall under which it had developed. The decomposition of the humus furnished some of the necessary plant nutrients for crop production. However, from the very beginning, the need for additional phosphorus for successful crop production has been apparent on the virgin soils of this area. In fact, it is difficult to maintain yields of nonleguminous crops on most of the soils of the area without the use of fertilizer supplying nitrogen, phosphoric acid and potash. Lime also is an almost universal need, especially if legumes are grown. The use of commercial fertilizers was therefore developed rapidly in this area as an essential to satisfactory crop production.

Even with heavy use of commercial fertilizers, a permanent system of agriculture, providing for adequate soil conservation, is not a reality on many farms of the Piedmont

*Reprinted from "Agronomic Notes" National Fertilizer Association, October, 1946.

Plateau and Appalachian Mountain areas. Why does this situation exist? Chemical fertilizers are not ruining the land, as some would have us believe. The simple fact is that the right combination of crop selection, soil management, and fertilization has not been put into effect. Reclamation of much of this eroded land is dependent on the use of sod farming crops, fertilizers and lime. Fertilizers and lime alone will not turn the trick without the close-growing crops, nor will the sod crops grow and protect the land without the use of fertilizers and lime.

These facts are illustrated very strikingly by experiments carried out cooperatively between the Appalachian Forest Experiment Station and the North Carolina Agricultural Experiment Station on a small watershed in western North Carolina, consisting of eleven acres of severely eroded, abandoned crop land. The soils are principally Hayesville and Halewood clay loam. At the beginning of the experiment, the land held a sparse cover of saw briers, broomsedge, poverty grass, bracted plantain, field daisy and similar plants, as well as a few small pines. Serious gullies were developing.

From 1935 to 1940 the Appalachian Forest Experiment Station kept rainfall, runoff and soil loss records. Beginning in the fall of 1940, through cooperation with the North Carolina Experiment Station, an attempt was made to establish a permanent pasture sod on the area and to determine the effect of this change in vegetative cover on the hydrology of the watershed.

Brush and shrubs were cut and piled in the gullies and one ton of dolomitic limestone per acre was broadcast on the surface in the fall. After a light disking, 400 pounds of superphosphate and one bushel of Abruzzi rye per acre were drilled in. These treatments were applied to the whole watershed except for some plots left for comparisons.

Korean lespedeza was seeded in the spring of 1941. Grazing was started in July 1942. Phosphate was reapplied in the fall of 1944 and lime and phosphate were applied in the spring of 1946. The following table (Data from W. W. Woodhouse, Jr.) shows the effect of fertilization on sod yield:

YIELD OF CLIPPINGS IN LBS. DRY MATTER PER ACRE						
Treatment	1941	1942	1943	1944	1945	Aver.
Check.....	1253	631	601	324	1117	785
Lime.....	1511	1104	702	538	1207	1012
Phosphate....	1229	942	624	886	1275	991
Lime and....						
Phosphate.	2794	2226	1185	1784	1897	1977

The unfertilized plots failed to produce a good ground cover and even the portion that was covered had largely undesirable species as shown by the following table:

Treatment	Percent Weeds and Undesirable Species
Check.....	74
Lime.....	56
Phosphate.....	50
Lime and Phosphate.....	29

The quality of the sod and ground cover has continued to improve on the treated plots. The area furnished 32 cow-days grazing per acre in 1942, 43 in 1943, 106 in 1944, and 105 in 1945.

The infiltration rate has increased materially and, while runoff occurs after the soil becomes saturated with water, soil loss has been reduced to a negligible figure since the establishment of sod cover.

Not only has soil conservation been achieved through finding a workable combination of crops and fertilizers but an area which had become incapable of production under its former management is once more an income producer. Soil conservation is difficult to achieve unless production and income are increased at the same time.

Of course, on most farms, it is not possible to keep all the land in sod all the time. But tests at erosion experiment stations have repeatedly shown that sod crops turned into the land help very materially to lessen erosion during the time when the same land is occupied by any following row crop. On very sandy soils in the Southeast, this effect may last only a few months but on heavier soils it is quite evident throughout the year.

If commercial fertilizers increase crop yields on depleted soils, what will be their effect on the restoration of organic matter supplies? The answer has been found by a number of experiment stations. Productivity indices published several years ago by the Ohio and Missouri Agricultural Experiment Stations recognized the importance of crop residues and gave them positive credits for maintaining soil productivity. Data obtained by R. L. Lovvorn of the North Carolina Agricultural Experiment Stations demonstrate the effect of commercial fertilizer on soil organic matter. In the spring of 1937 he seeded a Dallis grass-lespedeza sod on a Norfolk sandy loam using several different fertilizer treatments. In the fall of 1942, the plots were sampled to determine the effects of the sod cover and the treatments on the

(Continued on page 26)

Fertilizer Control Officials Hold Annual Meeting

Problems of New Materials and Increased Production Discussed. B. D. Cloaninger, Clemson, S. C., Elected President.

The new problems facing both the fertilizer manufacturers and the state control officials, due to the great increase in fertilizer consumption and the complex nature of some new fertilizer materials, formed the main theme for discussion at the second annual meeting of the Association of American Fertilizer Control Officials, which was held at the Shoreham Hotel, Washington, D.C., on October 10th.

In his opening address the president of the Association, Allen B. Lemmon, of Sacramento, Calif., emphasized the burden of the increased inspection and analysis created by the steadily growing tonnage during the past years. In fact, he said, one of the fundamental problems facing the officials today is that of answering the question "What is a fertilizer?"

"This was not much of a problem in former years," he said, "but some people seem to have the idea that the customary N-P-K mixtures are old fashioned and they want to sell mixtures containing all the elements, including soil correctives, with hormones to make plants grow better, hormones to make weeds grow less, micro-nutrients to mineralize the food crops, and the whole thing fortified with vitamins and inoculated with bacteria, with just a little radioactivity thrown in to give the mixture the new look.

"In order to squeeze all these goodies into the sack, like Christmas toys into a stocking, sometimes there isn't room for N-P-K. The question arises—how much can be left out of a fertilizer and still leave it a fertilizer."

Another problem with which fertilizer control officials are faced, the speaker said, is that of achieving a uniform attitude not only to interpretations of legal requirements, analytical methods, terminology, sampling technique, and such matters but also to development of a uniform method of rendering decisions on samples analyzed.

In his address, Mr. Lemmon cited a typical letter from a member of the "organic gardening" cult and said: "If these statements were true, fertilizer officials are remiss in permitting sale of chemical fertilizers. Of course, all of us recognize the value of organic material, but

it is difficult to see how composts could possibly supply the quantities of plant foods we now use."

F. S. Lodge, acting president of the National Fertilizer Association, also addressed the convention and reviewed his more than 40 years' experience with fertilizer control officials. "By and large it is my considered opinion," he said, "that the fertilizer manu-



NEWLY ELECTED OFFICERS OF THE ASSOCIATION OF AMERICAN FERTILIZER CONTROL OFFICIALS

Bottom row (left to right): Allen B. Lemmon, Chief, Bureau of Chemistry, California Department of Agriculture, Sacramento, Cal., Chairman of the Executive Committee and immediate past President; B. D. Cloaninger, Head, Department of Fertilizer Inspection and Analysis, Clemson Agricultural College, Clemson, S. C., President; Dr. F. W. Quackenbush, Head, Department of Agricultural Chemistry, Purdue University, Lafayette, Ind., Vice-President; Henry R. Walls, Inspection and Regulatory Service, College Park, Md., re-elected Secretary-Treasurer.

Top row (left to right): J. W. Kuzmeski, Official Chemist, Feed and Fertilizer Regulatory Service, Agricultural Experiment Station, Massachusetts State College, Amherst, member of the Executive Committee; Bruce Poundstone, Head, Department of Feed and Fertilizer Control, Agricultural Experiment Station, University of Kentucky, Lexington, Ky., member of Executive Committee; Dr. J. F. Fudge, State Chemist, Texas Agricultural Experiment Station, College Station, member of Executive Committee and H. A. Halvorson, Chemist in Charge, Division of Feed and Fertilizer Control, St. Paul, Minn., Member of Executive Committee.

Photograph Courtesy of American Plant Food Council.

facturer honestly desires and expects to deliver the amount of plant food that he sells. Perhaps it is to his selfish interest to do so, if you please, because if his customer does not prosper he will not prosper or even survive. But essentially he is honest.

"In turn the control official is just as much interested in protecting the honest manufacturer as he is in protecting the farmer. His function is to administer the law impartially, and the law protects both buyer and seller alike.

"It is the combination of these two basic factors that has made possible the fine co-

production of higher analysis fertilizers, greater variations in goods are inevitable, which in turn present difficult problems of analysis.

The members of the Association were entertained at dinner by the American Plant Food Council. Clifton A. Woodrum, president of the Council, presided. He reminded the control officials that "it is the responsibility of men in the field of science as well as in industry to acquaint their legislators both at the State and National levels, with the problems in which they have a vital concern and which are important to the well-being of the country." Himself a member of Congress for nearly 25 years before resigning to assume his present position, he pointed out "that all too often constituents wait until their problems become aggravated almost beyond solution before they acquaint their legislative representatives with the facts which are so essential in arriving at a solution or in taking intelligent action."

The officers of the Association for the ensuing year were elected as follows: President, B. D. Cloaninger, Clemson, S.C.; Vice-president, F. W. Quackenbush, Lafayette, Ind.; Secretary-treasurer, Henry R. Walls, College Park, Md.; Executive committee (2 year term) J. W. Kuzmeski, Amherst, Mass. and Bruce Poundstone, Lexington, Ky.; (1 year term) H. A. Halvorson, St. Paul, Minn. The retiring president, Allen B. Lemmon, becomes ex officio a member of the executive committee.



CLIFTON A. WOODRUM, PRESIDENT OF THE AMERICAN PLANT FOOD COUNCIL, ADDRESSING FERTILIZER CONTROL OFFICIALS

Others shown in the picture (left to right) are, G. F. MacLeod, Sunland Industries, Inc., Fresno, California, representing the California Fertilizer Association; B. D. Cloaninger, Head, Department of Fertilizer Inspection and Analysis, Clemson Agricultural College, Clemson, South Carolina, newly-elected President of the Control Officials, and Allen B. Lemmon, Chief, Bureau of Chemistry, California Department of Agriculture, Sacramento, Chairman of the Executive Committee and immediate past President.

Photograph Courtesy of American Plant Food Council.

operation between officials and industry representatives that has existed over the 40 years of my own experience. May it always continue."

At a round table discussion during the afternoon session, Dr. H. B. Siems, director of Chemical Control and Research, Swift & Co., declared that the fertilizer industry has done a magnificent job but that more recently the shortage of some raw materials and the advent of new materials together with the decline in the quality of available labor have presented the industry with complicated problems. He said that with the

Slate Accepts Puerto Rico Post

William L. Slate, Director Emeritus of the Connecticut Agricultural Experiment Station, has accepted a post as consultant at the Rio Piedras Agricultural Experiment Station of the University of Puerto Rico.

He has been invited by Dr. Arturo Roque, Director of the Puerto Rico Experiment Station, to spend a year there in an advisory capacity. His first assignment will be to assist the staff in the preparation and writing of manuscripts, and to set up an editorial department.

Mr. Slate retired last January as Director of the Connecticut Station, a position he had held for 24 years. His record ranks fourth in years of service among all experiment station directors in the country. At the time of his resignation, the Station Board of Control conferred on him the title of Director Emeritus.

October Crop Report

The October estimates of the Crop Reporting Board, U.S. Department of Agriculture, released on October 11th, confirm the predictions of earlier months that the 1948 harvest will show record yields in most of the important agricultural products, and, on the whole, be the best year in the history of United States farming.

The harvest of corn, oats, barley, flaxseed, sorghums, soybeans, peanuts, potatoes and sugar cane was above that of 1947. Wheat, rice, sweet potatoes, tobacco and sugar beets dropped below the 1947 level but were, except for sweet potatoes, above the average for the 1937-46 period. In fact, of the 34 individual

crops listed, only rye, buckwheat, dry field peas, sweet potatoes, broom corn, apples and pears were below the 10 year average.

The most sensational increase, of course, was the corn crop of over 3½ billion bushels, an increase of more than a billion bushels over 1947 and of 700 million bushels over the 10-year average.

Marshall Plan to Include French Nitrogen Plants

The Economic Cooperation Administration, which has charge of the European Recovery Program, has announced that 300,000,000 francs, equivalent to \$1,000,000, has been released from the French counterpart fund for the erection of new fertilizer nitrogen plants in France.

The counterpart fund is made up of deposits of local currencies by the countries participating in the European Recovery Program equivalent to the grants received by these countries from ECA.

These counterpart funds are to be used, under ECA law, for internal monetary and financial stabilization, stimulation of productive capacity and the exploration and development of new sources of wealth.

The new construction will aid in the current French program which has as its objective the increase of fertilizer nitrogen production from 125,000 tons in 1947 to 350,000 tons in 1952.

St. Regis Develops New Valve Type Fertilizer Bag

St. Regis Paper Company has announced the successful development of a flat tube sewn valve multiwall paper bag, with a particular adaptability for use in the packaging of fertilizer.

The new bag, which is made without a gusset or sleeve in the valve, offers a saving in price, when compared with the regular valve bag, with the so-called L. C. sleeve, and extensive experiments with it in the fertilizer field have resulted in a highly satisfactory performance.

Reports from those plants in which the flat tube bag has been used indicate that there is no sifting and that the filled bags are easier to handle and also stack well.

As a result of the development by St. Regis of this new and less expensive valve bag, there is now available a lower automatic packing cost for the fertilizer industry.

CROP PRODUCTION
October 1, 1948

Total Production (in Thousands)

Crop	Average 1937- 1946	1947	Indicated Oct. 1, 1948
Corn, all, bu.....	2,813,529	2,400,952	3,567,955
Wheat, all, bu.....	942,623	1,364,919	1,283,770
Winter, bu.....	688,606	1,067,970	981,415
All spring, bu.....	254,017	296,949	302,355
Durum.....	34,619	43,983	45,938
Other spring....	219,398	252,966	256,417
Oats, bu.....	1,231,814	1,215,970	1,492,957
Barley, bu.....	298,811	279,182	317,240
Rye, bu.....	37,398	25,977	26,664
Buckwheat, bu.....	7,022	7,334	6,308
Flaxseed, bu.....	26,756	39,763	49,975
Rice, bu.....	60,460	79,345	78,766
Sorghums, grain, bu.	99,791	95,609	127,654
Hay, all, ton.....	97,563	102,500	99,094
Hay, wild, ton.....	11,437	13,306	12,916
Hay, alfalfa, ton....	31,540	33,475	33,765
Hay, clover and timothy, ton.....	28,617	32,569	29,503
Hay, lespedeza, ton.	5,807	6,768	6,933
Beans, dry edible 100 lb. bag.....	16,716	17,164	19,258
Peas, dry field, bags.	6,278	6,513	3,536
Soybeans for beans bushels.....	134,642	181,362	205,820
Peanuts, lb.....	1,750,718	2,187,985	2,293,985
Potatoes, bu.....	392,143	384,407	418,355
Sweet potatoes, bu..	64,866	57,178	52,665
Tobacco, lb.....	1,664,265	2,107,763	1,820,032
Sugarcane for sugar and seed, ton.....	6,060	5,437	6,191
Sugar beets, ton....	9,771	12,504	10,016
Broomcorn, ton....	43	33	28
Hops, lb.....	43,532	50,098	50,125
Apples, Com'l, bu..	115,058	113,041	96,319
Peaches, bu.....	66,725	82,603	67,467
Pears, bu.....	30,222	35,312	26,358
Grapes, ton.....	2,701	3,072	2,956
Cherries (12 States) tons.....	170	173	201
Apricots (3 States)..	240	198	250
Cranberries (5 Sts.)	674	790	899
Pecans, lb.....	109,476	188,639	169,684

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Manning of International Urges Extended Research

While terming research continuously and judiciously pursued as nearly a "guaranteed investment," putting its results to work is no longer a process that just happens, according to Dr. Paul D. V. Manning, vice-president in charge of research for International Minerals & Chemical Corporation. His paper on "Putting Research Results to Work" was delivered at the National Industrial Chemical Conference held in connection with the National Chemical Exposition at the Chicago Coliseum.

"It has been estimated recently," he pointed out, "that in 1948 industrial corporations in the United States will spend a total of \$750,000,000 for research. Industry does not spend this kind of money unless the results can be so applied that the returns are worthwhile.

"Broadly viewed, there is little or no risk in spending money on research if it is well done. It is when the process of industrializing the results of research begins that the real business risk starts.

"We are in a period of very high investment costs which means that the fixed cost burden on production will be great. Both the capital required to build plants and the cost of operation have attained such levels that risks to invested money have increased very much. It seems very likely that these high levels and consequent increased degree of money risk will not drop appreciably in the future.

"During the past three decades, both the methods of carrying out industrial research and its administration have undergone considerable change. In the early years, the scientist worked in his laboratory with or without a few helpers, mostly following his own desires and interests. As industry grew, the industrialists began to try to speed up and intensify the entire process of research. This was accomplished by putting teams of specialists cooperatively to work on each problem.

"The major essentials required before an enterprise can be brought to business success are: (1) good management; (2) a product that is the equal or better than anything on the market; (3) either a market that exists or one that can be created; (4) sufficient capital to carry the enterprise during this period; (5) a potential competitive position which can be maintained satisfactorily by reason of the cost of manufacture, plus patent protection for the process or product, which is of great help and sometimes

absolutely essential; (6) continuously satisfactory sources of raw material; (7) satisfactory means of producing the product, including both a process and plant; (8) research and development for the purpose of continuously maintaining and improving the position in the field once attained; (9) satisfactory personnel for the entire enterprise.

"Each of these essentials is so important that it is hardly possible to assign a preferred position to any one of them. The failure or lack of one of these factors will result in the failure of the entire enterprise, either during its development or shortly after it gets underway."

In conclusion, Dr. Manning defined research as a "carefully and logically planned endeavor participated in by every department of the corporation and success cannot be insured without the cooperation of each."

Walker to Head A.O.A.C

The 62nd annual meeting of the Association of Official Agricultural Chemists, held at Washington, D. C., on October 11-13, selected as its president for the coming year, L. W. Walker, of the Agricultural Experiment Station, Burlington, Vt. W. A. Queen, of the U. S. Food and Drug Administration, was elected vice-president. H. J. Fisher, New Haven, Conn., and G. H. Marsh, Montgomery Ala., the retiring president, were elected to the Executive Committee.

The Association decided to discontinue further work on the definition of fertilizer terms and interpretation of results, as this work has been taken over by the Association of American Fertilizer Control Officials.

August Superphosphate Production Increases

During August, production of superphosphate at 180 plants in the United States amounted to 845,000 equivalent short tons (basis 18 per cent A.P.A.), according to reports submitted to The National Fertilizer Association and a summary of reports submitted to the Bureau of the Census. Production during the month was above that for the preceding two months, but below that for any of the first five months of the year. Compared with last August, when production totaled 804,000 tons, the increase amounted to five per cent. The total supply, of 2,279,000 tons, was 33 per cent above a year ago. Shipments during the month, amounting to 522,000 tons, were nine per cent greater than the 478,000 tons reported for last August,

but the amount of superphosphate used in mixed goods, 339,000 tons, was lower. Stocks at the end of August, totaling 1,418,000 tons, were 64 per cent greater than at the end of August 1947.

Production of normal superphosphate during August amounted to 735,000 tons (18% APA), and represented 87 per cent of total production. Compared with last August, when normal superphosphate comprised about the same percentage of total production, there was a slight increase. Production of wet base goods, amounting to 4,600 tons (18% APA), jumped up sharply from the previous month's figure of 2,400 tons, but was 14 per cent below the 5,400 tons reported for a year ago. Such production represented only about one-half of one per cent of total production during August.

The month of August marked a new high in production of concentrated superphosphate. The 42,100 tons (45% APA) reported representing an increase of six per cent over the previous record of 39,800 tons, reached in May of this year, and was 37 per cent above the 30,700 tons reported for last August. Converted to an 18 per cent APA basis, August production of concentrated superphosphate represented 12.5 per cent of total production, while the average for the 1947-48 fiscal year was slightly less than ten per cent.

Total production of superphosphate for the January-August period amounted to 7,249,000 equivalent short tons (18% APA), an increase of seven per cent over the 6,744,000 tons reported for the first eight months of last year. Compared with that period, cumulative shipments of 3,993,000 tons were eight per cent greater, while use of superphosphate in mixed goods, totaling 2,987,000 tons, was four per cent lower.

SUPERPHOSPHATE PRODUCTION
(Short Tons)

Production	Normal 18% A.P.A.	Concen- trated 45% A.P.A.	Base Goods 18% A.P.A.
Production			
August, 1948.....	735,207	42,094	4,643
July, 1948.....	644,203	38,168	2,370
August, 1947.....	722,085	30,749	5,397
Shipments and used in reporting plants			
August, 1948.....	763,914	38,205	1,465
July, 1948.....	593,645	22,048	592
August, 1947.....	769,183	29,605	1,785
Stocks on hand			
August 31, 1948..	1,235,773	69,635	8,291
July 31, 1948....	1,251,822	65,746	5,113
August 31, 1948..	705,855	60,439	9,966

September Tax Tag Sales

Reports to The National Fertilizer Association from State control officials in the 14 States requiring fertilizer tax tags indicate that during September such sales were equivalent to 581,000 short tons. Louisiana no longer requires monthly reports of tax tag sales, so data pertaining to tag sales apply to 14 States. The tonnage reported by these 14 States for September was the highest since May and was 35 per cent above the 432,000 tons recorded for a year ago. This September showed an increase of 69 per cent from August, while for the same period last year that increase amounted to only seven per cent. Last September, Louisiana reported 60,000 tons.

Sales in the ten Southern States for Sep-

tember, totaling 399,000 tons, increased 32 per cent over the 302,000 tons reported for a year ago. Sales in the ten Southern States represented 69 per cent of sales in all 14 States, compared with 70 per cent last September. Eight of the ten States showed an increase over a year ago, with the tonnage increase for Georgia, amounting to 38,300 tons, being the greatest. The other two States, South Carolina and Florida, reported decreases. Compared with August, 1948, sales during September were almost twice as great, while for the same period last year the increase amounted to ten per cent.

The four Midwestern States, with total sales amounting to 182,000 tons, reported a 40 per cent increase over the 130,000 tons

(Continued on page 28)

FERTILIZER TAX TAG SALES COMPILED BY THE NATIONAL FERTILIZER ASSOCIATION

STATE	SEPTEMBER				JANUARY-SEPTEMBER		
	1948 Tons	1947 Tons	1946 Tons	% of 1947	1948* Tons	1947 Tons	1946 Tons
Virginia.....	47,497	33,554	38,362	100	544,127	541,554	547,278
North Carolina.....	73,478	48,328	43,919	96	1,201,095	1,250,719	1,282,051
South Carolina.....	37,390	38,940	31,514	104	15,460	687,489	724,035
Georgia.....	50,900	12,646	13,447	105	992,819	941,819	946,189
Florida.....	40,196	58,704	106,155	89	510,969	575,297	724,232
Alabama.....	18,659	11,050	20,900	136	833,917	611,500	732,550
Tennessee.....	24,645	15,897	5,275	118	353,268	299,071	277,694
Arkansas.....	10,041	4,351	4,250	142	198,912	139,868	137,050
Texas.....	77,190	66,990	62,127	119	337,676	317,045	287,832
Oklahoma.....	18,900	11,140	13,228	166	113,736	68,432	48,976
<i>Total South.....</i>	<i>398,896</i>	<i>301,600</i>	<i>339,177</i>	<i>108</i>	<i>5,841,713</i>	<i>5,432,794</i>	<i>5,707,887</i>
Indiana.....	65,589	55,659	43,877	121	661,300	548,005	491,742
Kentucky.....	26,575	26,128	17,325	135	437,028	323,720	277,991
Missouri.....	62,851	33,425	44,548	161	354,255	220,161	237,759
Kansas.....	27,230	15,195	11,903	105	105,953	101,018	51,988
<i>Total Midwest.....</i>	<i>182,245</i>	<i>130,407</i>	<i>117,653</i>	<i>131</i>	<i>1,558,536</i>	<i>1,192,904</i>	<i>1,059,480</i>
<i>Grand Total.....</i>	<i>581,141</i>	<i>432,007</i>	<i>456,830</i>	<i>112</i>	<i>7,400,249</i>	<i>6,625,698</i>	<i>6,767,367</i>

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All Nitrogen Materials Still Short of Demand. Price Increases Reported in Nitrogen Solutions and Domestic Nitrate of Soda. Mixing Operations Delayed by Late Shipment of Nitrogen Solutions. More Foreign Potash Hoped For.

Exclusive Correspondence to "The American Fertilizer"

NEW YORK, October 13, 1948.

Sulphate of Ammonia

No further changes in prices were noted and the demand continued heavy from various sections.

Nitrate of Soda

Domestic producers of this material raised the price October 1st which puts it more in line with the imported material price-wise. Material is taken in as fast as it is shipped by various buyers.

Nitrogen Solutions

One large producer raised the price effective October 1st, \$3.00 per ton and some others are expected to follow. Manufacturers have not received as much as last year in most cases and producers are behind on shipments. This situation has put some manufacturers in a rather uncomfortable position as far as their nitrogen supply is concerned.

Nitrogenous Tankage

Prices remain about the same and the production is about in line with the demand.

Castor Pomace

This material is in fair demand for shipment over the balance of the year with very few offerings noted. No change was made in prices.

Organics

Tankage and blood were scarce for prompt shipment, with some blood selling as high as \$7.90 per unit of ammonia. Some of this material went to both the fertilizer and feed trade. Tankage was in short supply with last sales around \$7.50 per unit of ammonia (\$9.12 per unit N), f.o.b. Eastern shipping points. Stocks were well cleaned up at all points. Vegetable meals were about the same as a week ago and prices at the low points

seem to be well stabilized. Linseed meal does not seem to sell under \$59.50 per ton, f.o.b. Minneapolis, for new crop material and some mild interest is noted in soybean meal for shipment over the balance of the year at around \$48.00 per ton, f.o.b. Decatur, Ill. New crop cottonseed meal is offered lower than the prompt material but so far fertilizer buyers have not bought very heavily.

Fish Meal

With the fishing season about over at most points along the North Atlantic coast, most available material is firmly held. There has been a fairly good demand from the feed trade, with fertilizer buyers not showing much interest. Last sales around \$128.00 per ton, f.o.b. shipping points, for the ground meal.

Superphosphate

While triple superphosphate was in demand and some export inquiries noted, regular superphosphate was in better supply and some buyers were delaying taking in their requirements on contract due to shortage of nitrogen solutions. This condition is expected to be corrected shortly as some of the smaller mixers have not yet started their mixing operations.

Potash

While no further word has been received of any new importations from abroad, some people in the trade seem to feel these shipments will come along in the not too distant future. Meanwhile, domestic producers are shipping out on contract.

Bone Meal

With several producers sold out for some time ahead and the feed trade taking most of the present production, a shortage of this material will probably exist for some time. Some offerings of imported material have been made.

PHILADELPHIA

Nitrogen Scarcity and Increase in Price Will Add to Cost of Mixed Fertilizers. Superphosphate Situation Easier

PHILADELPHIA, October 11, 1948.

The scarcity of chemical nitrogen becomes more apparent, and it is evident that most fertilizer materials will cost more money this season than last. The recent advance in the price of nitrogen solutions, it is said, will undoubtedly add to the cost of complete mixtures. And the tardiness of mixers in taking delivery of raw materials is causing alarm as to the consequences—when too much material will remain to be delivered in too short a time.

Sulphate of Ammonia.—This continued to be in great demand, with requirements far in excess of production. Resale offerings are exceedingly limited, though some technical grade stuff has been offered at \$75.00 per ton, ex warehouse.

Nitrate of Soda.—Movement is confined principally to spot delivery from warehouse stocks. The price of domestic grade was advanced \$3.00 per ton, effective October 1.

Ammonium Nitrate.—This material continues in short supply domestically, and no deliveries are expected from Canada for several weeks. The demand remains very strong.

Blood, Tankage Bone.—Feeding demand has slackened, and while the market is nominally easier, prices have not changed materially. Offerings have been made at \$7.00 to \$7.50 per unit of ammonia (\$8.51 to \$9.12 per unit N). Bone is quite scarce and no offerings reported at present. Hoof meal is in fair demand, with the supply short.

Fish Scrap.—The market remains firm with only limited offerings and no price change.

Phosphate Rock.—Market reported quiet with some accumulation of stocks due to

delay of acidulators in taking deliveries.

Superphosphate.—The market is reported a trifle easier, but movement is under normal because of inability of dry mixers to take delivery as expected.

Potash.—Active demand keeps the market in tight position. Shipments are all on contract and the buyers continue to hope their commitments can be increased. A new arrival of sulphate of potash from Germany is expected to arrive in the South later this month.

CHICAGO

Organics Market Confined to Spot Material. Large Quantities of Vegetable Meals Expected on Market Soon

CHICAGO, October 11, 1948.

The market on animal ammoniates in the middlewest has been very quiet and trading is more or less confined to material for early shipment. Buyers refuse to take a long range position due to anticipated large volumes of cottonseed and soybean meal being placed on the market on a large scale in the near future. Values have remained nominally steady insofar as asking prices are concerned, but some trading in dry rendered tankage has already transpired at 5 cents to 10 cents per unit of protein lower and where further interest is shown, bids are below this level.

Meat scraps are quoted \$95.00 to \$100.00 per ton and 60 per cent digester tankage \$100.00 to \$110.00 per ton. Dry rendered tankage sold at \$1.60 per unit of protein, f.o.b. shipping points and buyers' views are now 10 cents per unit lower. Wet rendered tankage and dried blood range from \$7.75 to \$8.00 per unit of ammonia (\$9.42 to \$9.72 per unit N). Bone meal is unchanged at around \$65.00 per ton for 65 per cent steamed product and 4½-45 per cent raw bone is \$60.00 to \$65.00 per ton.

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CHARLESTON

Potash and Nitrogen Still in Short Supply. Superphosphate Stocks Accumulating. Nitrate of Soda Price Increases

CHARLESTON, October 11, 1948.

Potash is now vying with nitrogen for first place on manufacturers' lists of scarce materials. Superphosphate is considerably eased in supply, as compared to this time last year.

Organics.—Demand for organics has slackened considerably, with only a few sales of blood being made recently. Domestic nitrogen is obtainable at prices ranging from \$3.50 to \$4.00 per unit of ammonia (\$4.25 to \$4.86 per unit N), f.o.b. works, depending on the producer's location. Imported organics remain at price levels that are unattractive to domestic buyers.

Castor Pomace.—The market is nominally \$27.50 to \$30.00 per ton, f.o.b. Eastern production points. Shipments are being made primarily against current contracts.

Dried Ground Blood.—The market is nominally \$7.75 to \$8.00 per unit of ammonia (\$9.42 to \$9.72 per unit N), f.o.b. Chicago in bulk and, the New York market is approximately the same, with offerings rather scarce.

Fish Scrap and Fish Meal.—Demand for fish meal is fairly quiet with 60 per cent protein grade at around \$130.00 to \$135.00 per ton, f.o.b. production points in the Southeast.

Nitrate of Soda.—The domestic price for American production nitrate of soda has been advanced \$3.00 per ton, effective October 1st. Bulk material now sells at \$45.00 per ton and bagged material at \$48.00 per ton, f.o.b. works.

Tankage.—Wet rendered tankage is bid

\$7.00 and asked \$7.50 per unit of ammonia (\$8.51 and \$9.12 per unit N), f.o.b. New York area.

Potash.—Potash continues short of demand, resulting in some resale material going at prices considerably higher than producer's schedules.

Phosphate Rock.—Heavy production has finally apparently caught up with demand and the market can be termed as "normal."

Superphosphate.—Stocks are fairly heavy and in some areas continue to create storage problems, due to inability of manufacturers in general to get sufficient nitrogen to make up fertilizers and bases.

Ammonium Nitrate.—The Canadian production during October is destined for export and supplies of this article remain far short of demand.

Sulphate of Ammonia.—Demand continues active and production insufficient to meet the call. The market continues tight with some resale material moving at prices above producers schedules.

New Bagpak Office in San Francisco

International Paper Company's Bagpak Division is opening a branch sales office in San Francisco in October. W. A. Scholl will be the district sales manager. The San Francisco office will be Bagpak's second branch sales office in California. The other office is located in Los Angeles with Frank N. Gladden as district sales manager.

The San Francisco office is Bagpak's twelfth district sales office. The other eleven are located in Atlanta, Baltimore, Baxter Springs, Kansas, Boston, Chicago, Cleveland, Los Angeles, New Orleans, Philadelphia, Pittsburgh and St. Louis. Bagpak's head office is in New York City.

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New Edition of American Plant Food Council Booklet

The American Plant Food Council has issued a second edition of its popular booklet, "Our Land and Its Care," containing 64 profusely illustrated pages on "our land and how to keep it productive."

Prepared in collaboration with the staff of the Agricultural Education Service of the U. S. Office of Education, the second edition was issued after the demands of county agents, vocational teachers and other agricultural leaders exhausted the first printing of 400,000 copies.

Forty photographs and 28 drawings, charts and tables are used in the publication to illustrate important lessons in land management, conservation and soil productivity.

"Many months of research went into the writing of 'Our Land and Its Care,'" said Clifton A. Woodrum, president of the Council. "Recognized agricultural leaders and officials were consulted. Simplicity and accuracy were foremost in the authors' minds. The testimonials of farmers, farm leaders, soil scientists and agricultural workers in general attest the value of this simplified text on the complicated subjects of land management, soil conservation and plant usage."

A copy of this booklet may be obtained without cost on request to the American Plant Food Council, 910 Seventeenth St., N.W., Washington 6, D. C.

Wiggers Appointed Hough Advertising Manager

The Frank G. Hough Company, Libertyville, Illinois, manufacturers of the Payloader line of power shovels and other material handling and road building equipment, has announced the appointment of Raymond P. Wiggers as advertising manager.

Mr. Wiggers has had extensive experience in the industrial advertising field since his graduation from Western Reserve University. He was formerly with the Towmotor Corporation and the Parker Appliance Corporation, both of Cleveland, Ohio.

Youths Test Crop Varieties and Fertilizer Treatments*

Experimenting with different fertilizer applications and crop varieties on a county level is a task an active group of farm boys have taken upon themselves as a project in Fayette County, Ind. The boys are members of the Connersville FFA chapter.

They could have gone to the state experiment station for results. But these boys were energetic and wanted to work locally to show themselves and county farmers what could be done.

Organizing last fall, the members decided upon such a project. They rented 26 acres of land from Wilbur Hamilton on a 50-50 basis. Then came the problem of finance.

They asked a banker to one of their meetings. He outlined two plans of financing their work. The plan the boys adopted called for eight members to sign individual notes, each for \$35. The boys' fathers were co-signers.

With \$280 and six bushels of Vigo wheat they started their "outdoor lab." Eight boys and six tractors prepared the seed bed. The Vigo wheat was sown in multiplication plots and the balance of the field was seeded to Hickman, the old standby in the county.

After harvesting this summer the chapter had 41½ bushels of Vigo wheat. Some was kept for the chapter to carry on further work next year. Six members took enough Vigo to seed three acres each and two advisory board members were allotted enough to seed one acre each. The chapter wants to get the wheat scattered where more farmers will see it growing, because they think Vigo is the wheat that should be grown in Fayette county.

Fertilizer Tests

While harvesting, the chapter sold \$300.12 worth of Hickman wheat from the combine. They kept 116 bushels for later sales. This wheat was stored in the farm shop and as soon as school begins the boys will clean, treat and market that seed to "fatten up" their FFA treasury. The project thus far has netted the chapter about \$275.

*From "Prairie Farmer" October 9, 1948.

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The wheat they planted was given 15 different fertilizer treatments. The boys wanted to see what analysis and amount of fertilizer would produce the best results.

Among the treatments on Vigo, 300 pounds of a 2-12-6 fertilizer at seeding time and a top dressing of 80 pounds of ammonium nitrate produced the best results. That plot yielded 42 bushels per acre compared to 20 bushels per acre on untreated plots.

Another Vigo plot treated with 600 pounds of 2-12-6 and top dressed with 80 pounds of ammonium nitrate yielded only 32 bushels per acre. The boys said, however, that it paid dividends over the plot having no plant food treatment.

On the Hickman wheat the check plot made only 18 bushels per acre. Under what they termed an ideal fertilizer treatment, 300 pounds of 2-12-6 and a top dressing of 80 pounds of ammonium nitrate per acre, the Hickman wheat yielded 34 bushels per acre. They found little difference on wheat yields where equal amounts of 3-12-12 and 2-12-6 were used.

In another field these same boys are testing different series of hybrids. Again they want to determine what series is best suited for their area.

In addition to producing wheat and corn,

these boys are experimenting with 2, 4-D to kill weeds. They selected a field heavily infested with bindweed. By fall they should have some definite conclusions on the use of 2,4-D.

Everett McCuley, FFA adviser, says many Fayette county farmers have visited the plots during the summer. They have been keeping progress checks both of the plots and the work of the chapter. McCuley says the program has been valuable to the boys because it has given them insights to experimental work, and borrowing money. The plots also serve as a laboratory for the city boys enrolled in vocational agriculture.

Widlar to Manage Chase Bag's Denver Office

J. P. Widlar, Chase Bag Company's Kansas City Branch representative for the past two years, has been assigned as Manager to the company's Denver, Colorado Sales Office. The announcement was made from the Chase General Sales Office in Chicago by R. N. Conners, Vice-President and General Sales Manager. Mr. Widlar, whose packaging experience with Chase began in 1937, replaces R. G. Bullock who immediately assumed the position of Sales Manager of the Chase Milwaukee Branch.



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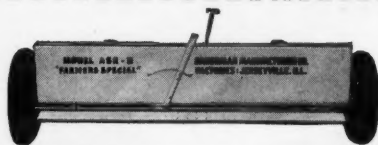
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U.S.D.A. PREDICTS INCREASED FERTILIZER SUPPLY

In a report issued on October 13th, the U.S. Department of Agriculture stated that preliminary estimates indicate a fertilizer supply for 1948-49 which will be about 7 per cent greater than that of 1947-48. In terms of plant food, the output for the 1947-48 year was more than 2½ times the average yearly consumption for the 1935-39 period.

The department said that phosphoric acid and potash appear to be in more plentiful supply than nitrogen, but added that consumption of all three of the principal plant nutrients almost certainly will be below the quantities that would be profitable if used to best advantage in balanced systems of farming.

Other extracts from the report with reference to fertilizers, were:

Increase in fertilizer costs from 1947 to 1948 will be larger than from 1946 to 1947. Costs in 1946, 1947, and the first half of 1948 were 24, 38, and 50 per cent respectively, above those prevailing during 1935-39. The continued rise in fertilizer costs during these years was more than offset by increases in prices received by farmers. It is probable that during 1949 fertilizer prices will be higher relative to prices received by farmers.

During the first half of 1948 the ratio of fertilizer prices to prices farmers received was about 80 per cent above pre-war. Except for certain cash crops, most farmers have not used as much fertilizer in the past as would have been profitable even at lower prices for crops. It seems that continued increase in the consumption of fertilizer in the immediate future can be expected within the limits of available supplies.

Combination of Cost Items

Price declines for some of the major cash crops may call for new combinations of cost items in farm production. For example, fertilizers can be used profitably to promote better land use, particularly if fertilizer costs do not increase relative to other operating costs. Judicious use of fertilizers will increase yields per acre and total production without extending the scale of operations. For this reason it may be advisable, in looking toward 1949, to select only the most suitable lands for growing of cash crops, and to give special attention to cultural practices. This adjustment should give a more profitable combination of land and fertilizer use on cash crops,

and permit more fertilizer to be used on feed crops and pasture during times when feeding ratios may become increasingly favorable for profitable livestock production.

Economical use of fertilizer on the farm requires consideration of more than the relation between individual crop prices and fertilizer costs, for low cost of production involves an economical use of all resources. Increasing the productivity of farm land, including pasture, through use of fertilizers, is often one means of obtaining the most profitable combination of all resources on the farm.

Adequate Insecticide Supply Expected

The department reported that raw materials and facilities needed for the manufacture and distribution of insecticides and fungicides are generally available and there is no indication that these products needed for the 1949 season will not be fully adequate.

Nicotine is the one insecticidal material for which the supply may be somewhat below demand, it was stated, but it now appears that the supply of nicotine insecticides will be more nearly in balance with demand in 1949 than in any other recent year.

Because of the many new insecticidal materials, and the uncertainty regarding the quantities of the different kinds that may be used in a given section, there may be local shortages even during a period of general favorable supply, the department said. Farmers should determine as promptly as possible, therefore, the kinds and quantities of insecticides and fungicides that they propose to use and give this information to their supplier so he will have full opportunity to obtain the materials.

Prices of insecticides and fungicides in 1949 will be about the same as in 1948, it was forecast.

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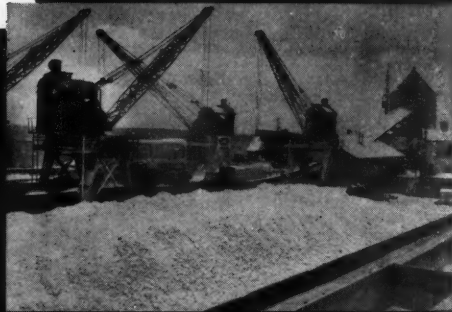
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THE ROLE OF COMMERCIAL FERTILIZER IN SOIL CONSERVATION

(Continued from page 8)

organic matter content of the soil. The results were as follows:

EFFECT OF FERTILIZER ON SOIL ORGANIC MATTER				
Fertilizer Treatment	Pct. Organic Matter Content in Soil at Various Depths			Av. Annual Yield of Forage (Lb. per A)
	0 to 2 in.	2 to 4 in.	4 to 6 in.	
None.....	1.21	.64	.63	1731
Phosphorous.....	1.25	.63	.66	2118
Phosphorous and Potash.....	1.49	.87	.76	2743
Phosphorous, Potash and Nitrogen.....	1.41	.86	.62	2876
Phosphorous, Potash and Lime.....	1.58	.94	.78	2365
Phosphorous, Potash, Nitrogen and Lime..	1.70	.91	.94	2717
Least Significant Difference.....	0.48	0.32	0.29	

Adequate use of commercial fertilizers in the Southeast has been restricted in the past to the more intensive crops such as tobacco and cotton. But alfalfa and Ladino clover are rapidly gaining headway. These crops, which accompany the development of livestock enterprises, can not be grown in this area without liberal use of fertilizer. As we begin to develop a more adequate fertilization program, coupled with the growing of sufficient sod crops on the sloping land in this

area, we will see substantial progress in soil conservation.

Let us not limit our definition of soil conservation to erosion control. Fertility and productivity conservation on the flatter lands should not be overlooked. Under heavy fertilization, certain soils are improving in nutrient status while, without fertilization, others are deteriorating. The States along the Atlantic seaboard, for example, have long been applying more phosphoric acid in fertilizer than is removed in the harvested crops. Some crops have received especially heavy fertilization while others, the majority, have not received enough to maintain crop yields. Studies made in 1945 (*Proceedings, Soil Science Society of America: 10:240-256*) on the nutrient status of cultivated soils in commercial potato-producing areas along the Atlantic and Gulf coasts revealed heavy accumulations of phosphoric acid, both total and available, when compared with comparable virgin soils. Somewhat smaller, but important accumulations of potash and calcium were also present, as illustrated by the data below:

A similar story would probably be revealed by careful examination of soils which have been cropped to tobacco and other intensively fertilized crops.

The decline of the cotton acreage in the South has brought it about that crops grown on lands formerly planted to cotton are benefiting from residual fertilizer. In many sections of the southern coastal plain, peanuts and cotton are grown in the same areas and in rotation with one another. It has been demonstrated that the most effective way to

State	Number of profiles compared	Type of Soil	Phosphoric Acid (P ₂ O ₅) (lbs. per 2,000 lbs. soil—Truog Method)		Potash (K ₂ O) (lbs. per 2,000,000 lbs soil)		Lime (CaO) (lbs. per 2,000,000 lbs. soil)	
			Cultivated Soil	Virgin Soil	Cultivated Soil	Virgin Soil	Cultivated Soil	Virgin Soil
Alabama.....	3	Surface soil	300	12	217	151	577	448
		Subsoil	72	5	283	113	459	246
		Surface soil	812	45	292	47	1053	146
Virginia.....	5	Subsoil	236	66				
		Surface soil	778	15	273	122	655	67
New York.....	3	Subsoil						

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fertilize a cotton-peanut rotation is to apply most of the fertilizer to the cotton crop and let the peanut feed on plant-food residue. Peanuts grown in such a rotation have not consistently yielded returns from fertilizer.

Cotton acreage has declined sharply in recent years and the acreage of peanuts has increased materially under the influence of war incentive programs. Peanuts stand out as the one crop whose yields have declined during recent years while those of practically all other crops have increased. There may be many reasons for this decline but should we not pause and consider whether the peanuts are getting their needed amounts of residual fertilizer from cotton and other crops in the rotation to the extent that they formerly did? Perhaps the problems of peanut fertilization and the maintenance of soil productivity will require re-examination.

The Middle West is just now beginning to use commercial fertilizers on a large scale. This area contains large acreages of relatively fertile soils. However, continued removal of large crops of corn, soybeans and the like has begun to take its toll. Potash deficiency is being reported with greater and greater frequency. While corn yields have increased to record levels, the average protein content has declined significantly. Perhaps the hybrid corn plants are able to use their nitrogen supplies more efficiently than the varieties formerly grown. However, protein can not be synthesized in the corn plant without the nitrogen which comes from the soil. And the protein content of grain can be increased materially by adequate nitrogen fertilization. This does not necessarily imply that all corn crops in the Corn Belt will require nitrogen fertilization in the immediate future. But there are many warning signs pointing to the fact that fertility conservation of soils in the Corn Belt is a problem of major importance.

And what about our great wheat-producing regions in the drier areas of the West? Fertilizers have not invaded this area extensively except on irrigated tracts. But will this continue to be the case? How can the nitrogen supply be maintained so as to continue to provide for removal of good wheat crops year after year? This is a problem the agricultural scientists will have to face.

Whether it be on rolling land where erosion control is the first consideration or on level land where fertility conservation becomes paramount, whether it be in humid areas where leaching is an important problem or in drier areas, the fertilizer industry is destined to play a major role in the conservation and maintenance of productive soils.

SEPTEMBER TAX TAG SALES

(Continued from page 14)

indicated for last September. Each of these States showed a gain over the preceding September, with Kansas reporting the largest tonnage increase. This September, sales were 27 per cent greater than for August, while last year the corresponding increase was only a small fraction of one per cent.

For the first nine months of the year, total sales of fertilizer tax tags in the 14 States amounted to 7,400,000 short tons. This represented an increase of 12 per cent over the 6,626,000 tons reported for the same period last year.

The ten Southern States, with total sales of 5,842,000 tons, marked an eight per cent increase over the first nine months of 1947. Individually, eight of these States reported an increase, with the gains ranging from less than one per cent for Virginia to 66 per cent for Oklahoma. Of the combined Southern and Midwestern States, January-September sales were greatest for North Carolina, with Georgia and Alabama following in that order.

Sales in the four Midwestern States totaled 1,559,000 tons during January-September. This was an increase of 31 per cent over the 1,193,000 tons reported for the same period last year.

Thomas Appointed General Manager of Southern Acid and Sulphur Co.

On October 1st, Joseph Mullen, president of Southern Acid & Sulphur Co., St. Louis, Mo. has announced the appointment of L. P. Thomas as General Manager of the company. Mr. Thomas will have supervision of the production, sales and purchasing departments.



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